# ADL Vicarious Calibration

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## 1. Determine gain for 745nm (M6) band

The aerosol model histograms (pixel based) for MOBY and SPG site were plotted with vgain(862) = 1, and vgain(745) = 0.985, 0.98, 0.975, 0.97, 0.965. It was then determined that vgain(745) = 0.975 had the best distribution (fewest out-of-bound pixels and reasonable aerosol model at the peak distribution).

## 2. Derive visible band gains

The visible band gains were derived from MOBY measurements with 21x21 pixels around MOBY location. For quality control, only the MOBY data with good quality within 12 hours of satellite passing time is used (quality flag=1), and the satellite data were filtered using the following OCC EDR quality flags:

QF3_VIIRSOCCEDR: epsilon value out of bound (bit 3), atmospheric correction failure (bit 4~6)

QF4_VIIRSOCCEDR: solar zenith > 70 (bit 3), sun-glint (bit 4), sensor zenith > 53 (bit 5)

QF5_VIIRSOCCEDR: cloudy, adjacent, cirrus, shadow, heavy/absorbing aerosol, aot>0.3 (bit 1~7)

QF7_VIIRSOCCEDR: bright target (bit 5)

Also another filter with aot(862)>0.15 were used

The ratio of satellite value to MOBY value for all 5 visible bands were than obtained for each pixel and then the pixel-based mean were derived (equivalent to scene-based mean with pixel count as weight). The gains for each visible band were then adjusted according to the mean ratios.

The Final gains for M1~M7 are: [0.9775, 0.9852, 0.9787, 0.9651, 0.9730, 0.9750, 1.0]